Arctic Mars Analogue Svalbard Expedition 05 season – A Summary.

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The AMASE expedition to Bockfjorden took place for the second year running. The international crew returned to the Sverrefjell volcano to continue to collect samples containing carbonate concretions similar to those found in ALH84001. Furthermore to sample blue ice containing lava tubes that appear 400M up the volcano and appear to contain ice that formed from fluids precipitating the globules.

The work was split into 2 distinct stages, sample gathering for laboratory work and field testing of instrumentation. Instruments deployed in the field this year include Raman and McDUVE spectroscopy instruments (JPL – P Conrad), enzyme assays ATP, LAL, PCR and antibody microarrays, as well as spectrophotometric assays of ammonia and pigment content (M Fogel). These instruments were tested together on the same samples at 2 sites, Sverrefjell itself and Jotun springs. Samples ranged from basalts and ice to carbonate dwelling endoliths and microbial mats. Spectroscopy was used to identify samples of interest, subsamples of these were then analysed in-situ using the suite of biotechnology life detection instrumentation described to verify the spectroscopy analysis. There was excellent accord between all techniques used. Further laboratory studies to understand the microbial population and geochemistry of the same samples are currently underway.

The philosophy of having spectroscopy instruments identify suitable places on a sample to measure and then to process these samples for other analytical techniques is one being used during the 2009 MSL mission to Mars and the investigations outlined here are a valuable step in verifying this approach.